



E-commerce 2003 Highlights

- E-commerce, on a percent change basis, outperformed total economic activity in all four major economic sectors measured between 2002 and 2003.
- Business-to-Business activity, which depends critically on Electronic Data Interchange (EDI), dominated e-commerce.
- Most e-commerce occurred in a handful of industry groups within each sector.
- For the first time, manufacturers' sales branches and offices (MSBOs) were included in the 2003 Annual Trade Survey and this report. Although MSBOs are classified as merchant wholesalers according to the 2002 North American Industry Classification System (NAICS), in this report, MSBO data are shown separately in Table 7.

This edition of *E-Stats* provides a snapshot of e-commerce activity for key sectors of the U.S. economy for 2003 and revises previously released data for 2002. The data

Note to reader

E-commerce data are collected in five separate Census Bureau surveys. These surveys use different measures of economic activity such as value of shipments for manufacturing, sales for wholesale and retail trade, and revenues for service industries. Consequently, measures of total economic and e-commerce activity differ in concept and definition among these sectors, and the total should be interpreted with caution. The Census Bureau's e-commerce measures include the value of goods and services sold online whether over open networks such as the Internet, or over proprietary networks running systems such as Electronic Data Interchange (EDI).

This report covers 2002 North American Industry Classification System (NAICS) industries that accounted for approximately 77 percent of the U.S. economic activity measured in the 2002 Economic Census. The report does not cover agriculture, mining, utilities, construction, agents, brokers, and electronic markets in wholesale trade, and approximately one-third of service-related industries. See **Explanatory Notes** for more information on report coverage, methods, and data reliability. Measures of sampling variability for Tables 1-7 are presented in Tables 1A-7A.

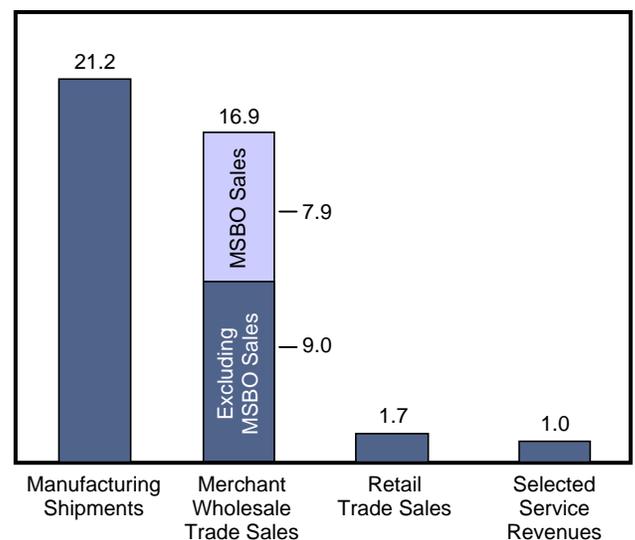
This edition of *E-Stats* revises 2002 data released in April 2004. See **Explanatory Notes** for additional information on the revisions. All reported changes between 2002 and 2003 reflect revised data for 2002.

are collected from approximately 132,000 manufacturing, wholesale, service, and retail businesses.

E-commerce—both its dollar value and share of economic activity—varied markedly among key economic sectors.

- Manufacturing led all industry sectors with e-commerce shipments that accounted for 21.2 percent (\$843 billion) of the total value of manufacturing shipments.
- Merchant Wholesalers including MSBOs ranked second with e-commerce sales that represented 16.9 percent (\$730 billion) of their total sales. MSBOs contributed 47 percent (\$343 billion) of the total Merchant Wholesalers Trade e-commerce sales.
- Retail Trade had e-commerce sales in 2003 that accounted for 1.7 percent (\$56 billion) of total retail sales.
- E-commerce revenues for the special grouping of service industries created for the *E-Stats* reports, Selected Service Industries, accounted for 1.0 percent (\$50 billion) of total revenues for these industries.

E-commerce as Percent of Total Value: 2003



U.S. Shipments, Sales, Revenues and E-commerce: 2003 and 2002

[Shipments, sales and revenues are in billions of dollars.]

Description	Value of Shipments, Sales, or Revenue				Year to Year Percent Change		% Distribution of E-commerce	
	2003		2002		Total	E-commerce	2003	2002
	Total	E-commerce	Total	E-commerce				
Total *	16,648	1,679	16,073	1,510	3.6	11.2	100.0	100.0
B-to-B*	8,296	1,573	8,063	1,424	2.9	10.5	93.7	94.3
Manufacturing	3,980	843	3,921	752	1.5	12.1	50.2	49.8
Merchant Wholesale	4,316	730	4,142	672	4.2	8.6	43.5	44.5
Excluding MSBOs ¹	2,946	387	2,824	343	4.3	12.7	23.1	22.7
MSBOs	1,370	343	1,318	329	4.0	4.1	20.4	21.8
B-to-C*	8,352	106	8,010	86	4.3	23.3	6.3	5.7
Retail	3,275	56	3,141	45	4.3	24.7	3.3	3.0
Selected Services	5,077	50	4,869	41	4.3	21.3	3.0	2.7

* We estimate B-to-B and B-to-C e-commerce by making several simplifying assumptions: manufacturing and wholesale e-commerce is entirely B-to-B, and retail and service e-commerce is entirely B-to-C. We also ignore definitional differences among shipments, sales, and revenues. The resulting B-to-B and B-to-C estimates, while not directly measured, show that almost all the dollar volume of e-commerce activity involves transactions between businesses. See the "Note to reader" for cautions relating to the interpretation of the "Total" shown here.

¹Manufacturers' Sales Branches and Offices

B-to-B and B-to-C E-commerce

In 2003, 94 percent of e-commerce was B-to-B. While the surveys did not collect separate data on business-to-business (B-to-B) and business-to-consumer (B-to-C) e-commerce, the table above shows that e-commerce represented a much larger share of total economic activity in sectors that sold primarily to other businesses.

Manufacturing

The value of U.S. manufacturing e-commerce shipments (E-shipments) was \$843 billion in 2003, an increase of 12.1 percent from 2002 e-shipments of \$752 billion. E-shipments, as shown in Table 1, accounted for 21.2 percent of the value of shipments from U.S. manufacturing plants in 2003. This information was collected in the 2003 Annual Survey of Manufactures (ASM), a survey of more than 55,000 plants.

E-shipments were concentrated. Seventy percent of all e-shipments in 2003 occurred in five industry groups. Transportation Equipment was the largest industry group, accounting for 39 percent (\$327 billion) of total manufacturing e-shipments, followed by

the Chemicals industry group with 10 percent (\$85 billion). Computer and Electronic Products contributed 8 percent (\$67 billion); Food Products accounted for 7 percent (\$60 billion) followed by Petroleum and Coal Products contributing 6 percent (\$52 billion) to total e-shipments.

The large e-shipments share for Transportation Equipment was consistent with the substantial role that group plays in manufacturing, where it accounted for 16 percent of all shipments. It also was consistent with the long history of EDI use in this group. E-shipments were pervasive in manufacturing, accounting for at least 10 percent of shipments in 15 of 21 industry groups. The e-shipments share of total shipments was largest in Transportation Equipment (50 percent) followed by Beverage and Tobacco (44 percent).

E-shipments in manufacturing rose more quickly than total shipments from 2002 to 2003 when total manufacturing shipments increased 1.5 percent and e-shipments increased 12.1 percent. The industry group that contributed the most to this difference

was Petroleum and Coal Products. In this industry, e-shippments increased 102 percent compared to an increase of 10 percent for total shipments.

Merchant Wholesale Trade

All U.S. merchant wholesalers including MSBOs reported e-commerce sales (e-sales) of \$730 billion in 2003, an increase of 8.6 percent over 2002 e-sales of \$672 billion. E-sales represented 16.9 percent of total merchant wholesalers sales in 2003, up from 16.2 percent in 2002.

Merchant wholesalers, excluding MSBOs reported e-sales of \$387 billion or about 53 percent of all merchant wholesale e-sales in 2003 and grew 13 percent when compared to revised 2002 e-sales. The MSBOs portion reported \$343 billion or 47 percent of the total merchant wholesalers trade e-commerce sales, but only grew at a 4 percent rate from the previous year.

This information was collected in the 2003 Annual Trade Survey, a survey of about 8,000 merchant wholesalers including approximately 1,300 MSBOs. Merchant wholesalers take title to the goods they sell. Tables 2, 3, and 5 therefore exclude agents, brokers, commission agents, and electronic marketplaces and exchanges. In the 2002 Economic Census, these wholesalers accounted for approximately 10 percent of total wholesale trade sales.

Among merchant wholesalers excluding MSBOs as shown in Table 2, e-sales were concentrated, with 61 percent of total e-sales occurring in three industry groups. Drugs and Druggists' Sundries wholesalers accounted for 34 percent (\$132 billion); Motor Vehicles, Parts and Supplies wholesalers, 17 percent (\$64 billion); and Professional and Commercial Equipment and Supplies wholesalers, 10 percent (\$39 billion). These same industry groups also accounted for about 61 percent of e-sales by merchant wholesalers excluding MSBOs in 2002.

Merchant wholesalers excluding MSBOs, as Table 3 shows, achieved e-sales primarily through EDI networks. All industry groups for this type of merchant wholesaler used

EDI networks, and most of the industry groups generated more than two-thirds of their e-sales through EDI networks. In 2003, EDI sales for merchant wholesalers excluding MSBOs totaled \$332 billion and accounted for 86 percent of their e-sales.

Table 7 shows several MSBO industry groups had over 25 percent of their sales over on-line networks including Drugs and Druggists' Sundries MSBOs with e-sales accounting for 54 percent of their total sales; Miscellaneous nondurable goods MSBOs e-sales were 43 percent of their total sales; and Grocery MSBOs e-sales were 34 percent.

Selected Service Industries

U.S. e-commerce revenues (e-revenues) for selected service industries were \$50 billion in 2003, an increase of 21 percent over revised 2002 e-revenues of \$41 billion. As shown in Table 4, e-revenues accounted for 1.0 percent of total revenues in these sectors.

Four groups accounted for 45 percent (\$23 billion) of total selected service e-revenues: Computer Systems Design and Related Services; Publishing, including newspaper, periodical, book, and software publishers; Securities and Commodity Contracts Intermediation and Brokerage; and, Travel Arrangement and Reservation Services.

The e-revenues share of total revenue was largest in Travel Arrangement and Reservation Services, accounting for 25 percent of the total revenue for this industry group. Online Information Services was the only other selected service industry group where e-revenues represented more than 5 percent of total revenues.

Total revenues grew 4 percent between 2002 and 2003 in the selected service industries while e-revenues grew by 21 percent. Within selected service industries, Selected Transportation and Warehousing, Selected Professional, Scientific, and Technical Services; and Selected Other Services showed strong growth.

The selected service industries total provided in Table 4 is not an official NAICS grouping, but rather the sum of the bolded groups shown in the table. Some of these groups are not complete. Incomplete industry coverage within a group is denoted by the absence of a NAICS code for a Table 4 bolded row and the use of "Selected" in the group description. Table 4 covers about two-thirds of the NAICS service-related industries included in the 1997 Economic Census. This information was collected in the 2003 Service Annual Survey, a survey of about 50,000 firms. Additionally, the NAICS codes shown in Table 4 correspond to the 2002 NAICS, with the exception of the Information Sector. Data in the Information Sector correspond to the 1997 NAICS.

Retail Trade

U.S. retail e-commerce sales (e-sales) reached \$56 billion in 2003, an increase of 25 percent over revised 2002 e-sales of \$45 billion. Retail e-sales, as shown in Table 5, accounted for 1.7 percent of total retail sales in 2003, up from 1.4 percent in 2002. This information was collected in the 2003 Annual Retail Trade Survey, a survey of about 19,000 retailers.

E-sales were concentrated in two groups that accounted for over 90 percent of retail e-sales: Nonstore Retailers, and Motor Vehicle and Parts Dealers. Nonstore Retailers accounted for 75 percent (\$42 billion) of retail e-sales. Motor Vehicles and Parts Dealers was the next largest with 17 percent (\$10 billion) of total retail e-sales.

The Electronic Shopping and Mail-Order Houses industry accounted for almost all of Nonstore Retailers e-sales. This industry includes catalog and mail-order operations, many of which sell through multiple channels, and "pure plays," retail businesses selling solely over the Internet. In addition, this industry includes e-commerce business units of "brick and click" retailers, if the e-commerce group operates as a separate unit and is not engaged in the online selling of motor vehicles. The decision rules used to determine what to include in the Electronic Shopping and Mail-Order industry result in almost all the sales and e-sales of

"brick and click" retailers being included in this industry which, in turn, reduces the e-sales shown in other retail groups. The exception to this rule is the online sales of motor vehicles. The online sales of "brick and click" vehicle dealers are shown in the Motor Vehicles and Automotive Equipment group. This exception reflects the continued importance of the dealership in actually closing the online deal and delivering the vehicle.

Retail e-sales growth of 25 percent between 2002 and 2003 strongly outpaced total retail sales growth of 4 percent. Within retail, e-sales of Nonstore Retailers grew 21 percent between 2002 and 2003, in contrast to the 8 percent increase in this group's total sales. For Motor Vehicle and Parts Dealers, total sales increased 3 percent while e-sales rose 40 percent.

Table 6 provides detailed information on the kinds of merchandise sold by businesses classified in the Electronic Shopping and Mail-Order Houses industry. The leading merchandise category within this industry was Computer Hardware with 2003 e-sales of \$7 billion, followed by Clothing and Clothing Accessories (including footwear) with \$6 billion in e-sales.

For the Electronic Shopping and Mail-Order Houses industry, e-sales accounted for 31 percent of total sales in 2003, compared to 27 percent in 2002. Merchandise categories with the highest percent of online sales included Books and Magazines with 52 percent of sales online and Office Equipment and Supplies with 50 percent of sales online. In fact, online sales were substantial in almost all merchandise lines.

More recent data on e-sales for retail trade are available as part of the ongoing quarterly retail e-commerce series. Data for 4th quarter 2004 and the preliminary estimate for the year 2004 were released on February 24, 2005.

U.S. retail e-sales were \$21 billion in the fourth quarter of 2004 and accounted for 2.2 percent of total retail sales (\$988 billion) in that quarter. The preliminary estimate of total e-sales for 2004 is \$69 billion,

accounting for 1.9 percent of total retail sales for 2004. The most recent data are available at <http://www.census.gov/estats>.

Explanatory Notes

General

The e-commerce estimates in this release are based on data collected from five surveys conducted by the U.S. Census Bureau: the 2002 Economic Census and 2003 Annual Survey of Manufactures (ASM), the 2003 Annual Trade Survey (ATS), the 2003 Service Annual Survey (SAS), and the 2003 Annual Retail Trade Survey (ARTS). These surveys were conducted independently. Measures of total economic activity and e-commerce are presented in this report to provide a broad perspective of e-commerce activity across the four sectors. Brief descriptions of the survey methods are given below. Industry classifications used in this report are based on the 2002 NAICS with the exception of the Information Sector shown in Table 4. Data in the Information Sector correspond to the 1997 NAICS. Information about NAICS and additional detail about coverage, sample design, and estimation methodology for the annual surveys may be found online at www.census.gov/estats. In addition, all current and prior reports, historical data tables, and past research papers are available at this same website.

Definitions of Economic Activity

The five surveys use different measures of economic activity.

ASM and the Manufacturing Sector of the 2002 Economic Census. "Value of Shipments" is the measure used in both the ASM and Economic Census. It is the market value of all commodities shipped from a plant. Value of shipments includes shipments to outside customers as well as to affiliated plants.

ATS and ARTS. "Sales" is the measure used in the ATS and the ARTS. Sales are the dollar value of transactions between the reporting firm and its customers. Sales include transactions to foreign affiliates, but exclude transactions among domestic affiliates.

SAS. "Revenue" is the measure used in the SAS. Revenues are the dollar value of transactions and contracts between the reporting firm and its customers. These values include services performed for foreign affiliates, but exclude transactions among domestic affiliates. Revenue includes the total value of service contracts, the market value of compensation received in lieu of cash, amounts received for work subcontracted to others and other industry-specific items.

Importance of EDI Networks

The dominant position of B-to-B e-commerce reflects the long-standing use of EDI in manufacturing and wholesale trade. EDI is the exchange of computer processable data in a standard format between organizational entities. There are two EDI standards. The Accredited Standards Committee X12 is the standard in North America, while UN/EDIFACT is the standard for Europe and most of Asia. The format and the data associated with any particular EDI transaction are defined in the X12 or EDIFACT EDI standards. While EDI transactions often are conducted over Value Added Networks, they also can be transmitted over open networks. EDI sales were separately identified for the first time in the 2000 Annual Trade Survey.

Survey Methods

Annual Survey of Manufactures and the Manufacturing Sector of the Economic Census

The 2003 estimates were derived from the 2003 ASM. The e-commerce estimates for 2002 were derived from the ASM while the estimates for total 2002 value of shipments were derived from the 2002 Economic Census. The manufacturing universe is comprised of approximately 345,000 plants. In the ASM, data are collected annually from a probability sample of more than 55,000 manufacturing plants with five or more employees. In the census, data are collected from all plants with five employees or more. For both surveys, data for plants with less than five employees are estimated using information obtained from administrative sources.

Both the census and the ASM are surveys of manufacturing plants and represent activities at individual plants rather than the entire company. For the 2003 and 2002 survey years, questions about e-commerce were included on the ASM/census questionnaires along with questions about such things as employment, payroll, value of shipments, cost of materials consumed, and capital expenditures. Information for nonresponding plants was imputed using information from responding plants with similar characteristics.

Shipments estimates for the NAICS subsectors were calculated by summing both the reported and the imputed plant data. For each plant the data were weighted by the reciprocal of the probability of the plant's inclusion in the ASM sample. These estimates were then linked to the 2002 Economic Census results to reduce sampling and non-sampling errors. The estimates for 2002 included in this report are revised from those originally published in the April 2004 edition of *E-Stats*. These revisions were small.

From the 2002 survey, approximately 5,000 establishments with e-commerce activity in 2001 indicated that they did not have e-commerce activity in 2002. After contacting a sample of respondents, we determined that a significant number of these respondents misinterpreted the e-commerce question on the 2002 Economic Census questionnaires, which was the same question used on the 2003 ASM questionnaires. The misinterpretation resulted in significant misreporting. Based on the results of the work we did with the sample of respondents, we adjusted both the 2002 and 2003 e-commerce estimates approximately 10 percent to compensate for this reporting error. While the adjustments were applied in a systematic fashion, we recommend caution when using data at more detailed levels and when making period-to-period comparisons.

Annual Trade Survey, Service Annual Survey, Annual Retail Trade Survey

The ATS measures the economic activity of merchant wholesale firms with paid employees including manufacturers' sales branches and offices. Merchant wholesale firms are those that take title to the goods they sell. Data are collected annually from about 8,000 merchant wholesale firms including 1,300 MSBOs. These data represent approximately 330,000 merchant wholesale firms with paid employees of which 20,000 are MSBOs. For the first time in the 2003 ATS, MSBOs were canvassed.

The SAS measures activity of employer firms classified in nine service-related sectors: Transportation and Warehousing; Information; Finance and Insurance; Real Estate and Rental and Leasing; Professional, Scientific, and Technical Services; Administrative and Support and Waste Management and Remediation Services; Health Care and Social Assistance; Arts, Entertainment and Recreation; and Other Services. Data are tabulated annually from about 50,000 firms representing the universe of approximately 3 million establishments with paid employees.

The ARTS measures the economic activity of all retailers with and without paid employees. The ARTS collects data annually from approximately 19,000 firms with paid employees. Sales for firms without paid employees are estimated using administrative records. The retail trade universe contains approximately 2.5 million firms.

For these three surveys, stratified random samples of firms were drawn from a sampling frame constructed using information from the 1997 Economic Census and updated with information from the Census Bureau's Business Register. The samples were subsequently updated to represent employer firms in business during 2003.

All wholesale, service, and retail firms mailed in the surveys were asked to report total and e-sales/e-revenue for 2003. MSBOs also were asked to report data for 2002. Wholesalers were asked to report e-sales made through EDI networks. Retailers in the Electronic Shopping and

Mail-Order Houses industry were also asked to report total sales and e-sales for 2003 for specific merchandise lines. E-commerce data for nonresponding employer firms and all retail nonemployers were imputed from responding firms within the same kind of business and sales size category.

Estimates of total sales/revenues and e-sales/e-revenues were calculated by summing data (both reported and imputed) weighted by the reciprocal of the probability of the firm's inclusion in the appropriate sample. The estimates in this report, except for MSBOs, have been linked to the 1997 Economic Census to reduce sampling error and to allow comparability with the census results. Additionally, the estimates of total sales/revenues have been benchmarked to preliminary sales/revenues totals measured by the 2002 Economic Census except for selected service industries. The corresponding estimates of e-sales/e-revenues have been modified accordingly to preserve their ratio to total sales as measured in the annual surveys.

Reliability of Estimates

The estimates in this release are based on sample surveys and are subject to sampling and nonsampling errors. Sampling error occurs because only a subset of the entire population is measured. Nonsampling error encompasses all other factors that contribute to the total error of a sample survey estimate and may also occur in censuses. Changes in data collection methods, report forms, and imputation methods all can affect the nonsampling error.

Tables 1A through 7A show standard errors for estimates of percentages and coefficients of variation for estimates of total dollar value. Some exceptions occur in which standard errors or coefficients of variation associated with the 2002 column are zero. The reason is this data is obtained directly from the 2002 Economic Census. The standard error measures the extent to which estimates derived from all possible samples drawn using the same design differs from the average of these estimates. The coefficient of variation (expressed as a percentage) is the standard error of the

estimate divided by the estimate. Note that standard errors and coefficients of variation are estimates derived from the sample and are also subject to sampling error.

The coefficients of variation presented in the tables may be used to compute confidence intervals about the sample estimates. The particular sample used for each survey included in this report is one of a large number of samples of the same size that could have been selected using the same design. In about 9 out of 10 (90 percent) of these possible samples, the estimates would differ from the results of a complete enumeration by less than 1.645 times the percentage shown.

To compute a 90-percent confidence interval for an estimate of level, multiply the estimate by its coefficient of variation and then by 1.645. This amount is then added to and subtracted from the estimate to give the upper and lower bounds of the interval. As an example, suppose the estimated total value of shipments is \$51,770 million and the estimated coefficient of variation for this estimate is 1.3 percent (0.013). Multiplying \$51,770 million by 0.013 and then by 1.645 gives \$1,107 million. Subtracting \$1,107 from and adding \$1,107 to \$51,770 million gives a 90-percent confidence interval of \$50,663 million to \$52,877 million. Confidence statements for estimated percentages are computed in a similar manner.

One source of nonsampling error is the inability to obtain information about all cases in the samples.

Other sources of nonsampling error include response errors, unclear definitions, differences in the interpretation of questions, mistakes in recording or coding the data obtained, and other errors of collection, response, coverage, and estimation of missing data. Although no direct measures of these sources of nonsampling error have been obtained, precautionary steps were taken in all phases of the collection, processing, and tabulation of the data in an effort to minimize their influence.

Percentage of Total and E-commerce Sales Obtained from Reported Data

Survey	Total Sales	E-commerce Sales
ASM	83	86
ATS	89	93
ARTS	93	90
SAS	87	73

E-Stats Reports

All *E-Stats* reports are available at www.census.gov/estats.

Future Reports

- Quarterly retail e-commerce data will be released on May 20, August 19, and November 22, 2005.
- *E-Stats* 2004 will be released in Spring 2006.

Prior Reports, Historical Data Tables, and Research Papers

All prior reports, historical data tables, and past research papers, are available at www.census.gov/estats.

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The Census Bureau is committed to providing the business community and policymakers with more relevant and useful economic statistics. We thank all the businesses that participated in these surveys. Their cooperation and continued participation is vital to the future success of the economic statistics programs.